UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,637	03/31/2004	Richard Jones	P-6478-US	4979

49444 7590 11/27/2006

PEARL COHEN ZEDEK LATZER, LLP
1500 BROADWAY, 12TH FLOOR
NEW YORK, NY 10036

EXAMINER	
DUPUIS, DEREK L	
ART UNIT	**PAPER NUMBER**
2883	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/813,637	JONES ET AL.	
	Examiner	Art Unit	
	Derek L. Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 March 2006 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/11/2006 have been fully considered but they are not persuasive. In pages 2 and 3, applicant argues that Wiesmann et al does not describe, teach, or fairly suggest a Bragg grating including first and second, different materials. The examiner respectfully disagrees. In page 365 of the Weisman reference, it is disclosed that "periodic refractive index changes" are made to the waveguide via a mask and UV irradiation to create a grating (see left hand-column, first full paragraph). Two regions with different refractive indexes are different from one another. The refractive index change is induced by "glass-phase transitions" (see last paragraph on page 365). The UV irradiation changes the properties of the altered regions.

2. In page 3, applicant argues that Weismann uses a single type of SiON waveguide. Again, the examiner references page 365 where Weismann explains that a phase mask is used in combination with UV irradiation to change the refractive index in a periodic manner to create a grating. What started as one SiON waveguide having a single refractive index, has been altered to create a bragg grating having periodic alternating regions of different refractive indexes. Weismann teaches in the last paragraph, that the induced refractive index change is due to a glass-phase transition.

3. In page 4, applicant argues that Liu et al teach away from a Bragg grating including first and second different electrically insulting materials. The examiner disagrees. Liu et al merely teach a different type of Bragg grating the deficiencies of which are overcome by the teachings of Weismann. Using SiON waveguides offers "a higher degree of design freedom in the

fabrication of planar optical waveguides because the refractive index can be varied from 1.45 up to 2.00."

4. In page 5, applicant argues that the combination would result in alternating regions of a semiconductor substrate rather than alternating regions of electrically insulating materials. Again, the examiner respectfully disagrees. Weismann teaches that the periodic regions of different refractive indexes are materials such as SiON altered by UV irradiation. SiON is an electrically insulating material.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Liu et al (US 2002/0197013 A1)*** in view of ***Wiesmann et al ("Large UV-induced negative index changes in germanium-free nitrogen-doped planar SiO_2 waveguides")***.

7. Liu et al teach an external cavity laser device (101) comprising a laser source (121/123) and an external laser cavity defined between the laser source (121/123) and a Bragg grating (113). The Bragg grating (113) is formed in a semiconductive layer (105) attached to an insulating substrate (107) (see paragraph 24). The Bragg grating (113) shown in better detail in figure 2 and referenced as "201". The Bragg grating (113/201) includes a plurality of alternating elements of first and second, materials with different refractive indicies (see paragraphs 25 and 29-31). The alternating elements are substantially in contact with the insulating substrate (107)

as shown in figure 1. The external cavity laser device is able to oscillate an optical signal generated by the laser source (121/123) at a substantially fixed frequency determined by the structure of the Bragg grating (113/201) (see paragraphs 22, 26, and 27). The device can also comprise a ribbed waveguide as shown in figure 3. The ribbed waveguide is in a direction substantially perpendicular to interfaces between the first and second elements of the Bragg grating as is shown in the figure. Liu et al also teach that a current injection modulator can be used to modulate an optical signal generated by the laser (see paragraphs 47-51).

8. Liu et al also teach an optical multiplexing system with optical transmitters and receivers as shown in figure 9 (also see paragraph 5). The optical splitter acts as a switch to switch optical signals between the plurality of output branches as can be seen by the figure. The transmitter includes an optical component including the Bragg grating discussed above. The waveguide of the Bragg grating can have a ribbed structure as discussed above and the plurality of alternating elements are in contact with an insulating substrate layer as discussed above. The transmitter comprises an optical coupler where the output of the transmitter is coupled to the input of the splitter as can be seen in the figure.

9. Liu et al also teach a method as shown in figures 1-3 and 7-9 of guiding an optical signal and of performing an optical function on the signal using an optical arrangement comprising a Bragg grating as discussed above. Liu et al teach that the optical function could include oscillating an optical signal at a desired frequency (see paragraph 27 and figure 1), reflecting a signal (see figure 1 and paragraph 26) and filtering a signal (see paragraph 27 and figures 7 and 8).

10. Liu et al teach a system including an external cavity laser comprising a Bragg grating with a plurality of alternating elements as discussed above. Liu et al also teach that the laser can be coupled to an optical fiber or waveguide to transmit an optical signal as shown in figure 9. While Liu et al teach that the system outputs optical signals, Liu et al do not teach that output of the laser is coupled to a power monitor to monitor the optical power. Liu et al teach that receivers can be used to receive outputs (see paragraph 5). It is routine in the art that optical receivers monitor output power.

11. Liu et al do not teach that the plurality of alternating elements comprise different types of silicon oxynitride and that the elements differ in their relative concentration of oxygen and nitrogen. Wiesmann et al teach that SiON is commonly used in planar optical devices such as waveguides and Bragg gratings (see first paragraph of Wiesmann et al). Wiesmann et al teach exposing a SiON waveguide to UV light to create an alternating pattern to make a Bragg grating (see first and second paragraphs). The exposed areas would alternate with unexposed areas and the areas would differ in their concentrations of oxygen and nitrogen and thus would have the different refractive indicies needed for Bragg grating effects (see first three paragraphs). SiON is an electrically insulating material.

12. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the external cavity laser of Liu et al by using SiON with alternating regions having different compositions of oxygen and nitrogen as taught by Wiesmann et al so as to create alternating regions with different refractive indices. Motivation to do this would be that SiON is known to "offer a higher degree of design freedom in the fabrication of planar optical waveguides because the refractive index can be varied from 1.45 up to 2.00" (see first

paragraph). Furthermore motivation is the suggestion by Wiesmann et al to use the SiON alternating elements in a Bragg grating (see first paragraph).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

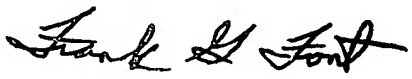
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek L. Dupuis
Group Art Unit 2883



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800